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Nonmedical Prescription Stimulant Use among College Students: Why We Need To Do Something and What We Need To Do

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Abstract

This paper summarizes recent research findings on nonmedical use of prescription stimulants and outlines a multi-pronged strategic approach for responding to this unique problem among college students. Students, health professionals, parents, the pharmaceutical industry, and institutions of higher education all have a role to play in this response. Moreover, the academic community should view the translation of research findings as an important responsibility that can help dispel the myths often perpetuated in the media. The nonmedical use of prescription stimulants is a complex behavior, and should be viewed in the larger context of alcohol and drug involvement among young adults. Strategies to reduce nonmedical use of prescription stimulants might have direct application to the abuse of other prescription drugs, including opiates.

INTRODUCTION

At the national level, nonmedical use of prescription drugs is becoming an increasingly important part of the illicit drug use problem among college students.¹ Recent news publications have identified the nonmedical use of prescription stimulants as a clinical concern for physicians and family health practitioners.² This paper focuses on the well-documented problem of nonmedical use of prescription stimulants (including Adderall,[®] Ritalin,[®] and Concerta[®]).^{3–7}

Recent research has documented that these drugs are widely available on college campuses for nonmedical use, owing in part to their pharmacologic properties as stimulant drugs.^{3, 5, 8} This particular class of drugs appears to be sought out by students who might be struggling academically. Reducing nonmedical use requires careful attention to a complex set of factors, including the underlying reasons for decreased academic performance (e.g., possible involvement in other drug use and/or heavy drinking). Moreover, a simultaneous focus on the supply and demand sides of the problem is warranted, as well as on influential actors in students' lives, such as health care professionals, other students, school administrators, teachers, and parents. All of these groups have a stake in reducing the problem of nonmedical use of prescription stimulants. From a policy perspective, there is the need to recognize the meaning and risks of nonmedical drug use. From a treatment perspective, if nonmedical prescription stimulant use continues to escalate, it is possible that it could become more difficult for physicians to prescribe Attention Deficit Hyperactivity Disorder (ADHD) medications when clinically necessary for fear that the medications will be used illegitimately. The Food

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and Drug Administration (FDA) has recently required manufacturers of these medicines to put a “black box” warning on the medications highlighting the potential for serious consequences resulting from misuse.⁹ The warning informs both physicians and patients that misuse of the medicine could cause “sudden death and serious cardiovascular adverse events.” The warning also prominently identifies the drug as having “a high potential for abuse” and cautions against “the possibility of people obtaining amphetamines for non-therapeutic use or distribution to others.” We view the implementation of this warning as an important step toward raising physicians’ awareness about the seriousness and extent of diversion (defined as sharing, selling, or trading to others who do not have a prescription) as well as the nonmedical use of prescription stimulants. Ultimately, these precautionary statements should stimulate appropriate conversations between physicians, patients, and caregivers.

There is a growing base of scientific literature illustrating the magnitude and correlates of nonmedical use and diversion of ADHD medications.^{6, 10–13} This paper attempts to consolidate discussions in the literature in order to define the issues surrounding the nonmedical use of prescription stimulants and present a plan to diminish such use.

DEFINING THE ISSUES

Popular Myths Regarding Nonmedical Use of Prescription Stimulants

College students are exposed to a great deal of misinformation about nonmedical prescription stimulant use due to the popularity of enticing myths. Anecdotal evidence exists that stimulants are “performance enhancers”, and are therefore beneficial to students struggling with final exams and other situations of intense academic pressure. With headlines referencing “smart drugs” and “smart doping,”^{14–16} many media outlets have fueled the myth that nonmedical use of prescription stimulants increases academic performance and that stimulants are used nonmedically by the best students. As will be discussed below, there is scientific evidence to the contrary. However, a careful read of the anecdotes reported in the media and entries on websites on the topic suggest that a great deal of individual variation exists with regard to purported effects and experiences. A prevailing attitude, shared by many parents and physicians, is that the nonmedical use of prescription stimulants is benign and therefore not a major concern. In a recent article on the nonmedical use of stimulant medications as “study aids,” a distinguished physician said, “It doesn’t seem to be causing too much trouble since most [students] use the drugs not to get high but to function better. When exams are over, they go back to normal and stop abusing the drugs.”¹⁷ We believe this commonly expressed attitude trivializes nonmedical prescription drug use and exacerbates a serious problem that requires an effective multidisciplinary response.

A growing number of studies published in the peer-reviewed literature call into question these widely held assumptions. Three findings in particular have important implications. First, nonmedical prescription stimulant users typically have lower grade point averages than non-users,^{4, 5, 18} suggesting that academically successful students are not likely to use prescription stimulants nonmedically.

Second, nonmedical prescription stimulant users are more likely than other students to be heavy drinkers and users of other illicit drugs.^{4, 19, 20} Table 1 describes the relationship between nonmedical prescription stimulant use and alcohol/illicit drug use from 15 separate studies. Moreover, even among those who only use stimulants nonmedically to study or concentrate, nonmedical use is usually part of a larger problem of illicit drug use. Rather than being perceived as a benign behavior, the nonmedical use of prescription stimulants should be seen as a marker of underage and often excessive alcohol consumption and illicit drug use. Third, academic enhancement is not the only motivation for nonmedical prescription stimulant use; many students use these drugs nonmedically to enhance their experience of partying and getting

high on other substances. Compared to non-users, research has demonstrated that nonmedical users of prescription drugs are more likely to meet DSM-IV criteria for dependence on alcohol and marijuana, skip class more frequently, and spend less time studying.¹⁸ In summary, nonmedical use of stimulants as a “shortcut” to compensate for partying or not going to class does not appear to be an effective strategy to increase academic performance. There is growing evidence suggesting that nonmedical prescription stimulant use does not confer substantial academic benefit. Although stimulant medications—when used safely under proper medical supervision for the treatment of ADHD—can be instrumental in achieving therapeutic goals related to academic performance, there is no basis for making the assumption that similar benefits can be attained by “healthy” individuals using the drugs intermittently and without medical supervision.

New research has demonstrated that performance improvements related to methylphenidate administration in healthy volunteers are highly variable and might be dependent on baseline cognitive ability. Specifically, performance was improved when cognitive processing was below optimal, and performance deteriorated where optimal performance was reached under placebo conditions.²¹ Moreover, the fact that many nonmedical users consume the drugs only a few times with no obvious adverse consequences is not an indication that the behavior is harmless. On the contrary, rather than being dismissed as an innocuous behavior, nonmedical use of prescription stimulants should be seen as a marker or “red flag” for involvement in other types of illicit drug use, poor academic performance, and possible mental health problems. Certainly, more research is warranted in this area to understand the associations between nonmedical use of prescription stimulants, other drug use and possible academic performance difficulties. Nonmedical users may even benefit from a clinical assessment for ADHD.^{8, 22} Nonetheless, it is necessary to dispel the powerful myths (that are not supported by current research evidence) circulating among some parents, students, and the media that are used to rationalize the nonmedical use of prescription stimulants. Furthermore, prescribing physicians and college health centers need to be aware of this information because it has important implications for why this behavior should be regarded as concerning rather than benign, and why the nonmedical use of prescription stimulants should trigger an assessment for possible underlying drug use, academic problems, and mental health issues.

Illegality of Nonmedical Use

It is important to emphasize the illegality of diversion of prescribed medications. In a recent study of 81 college students with ADHD, 62% diverted the medication to someone without a prescription.¹³ Few college students might know that it is illegal to give or sell their controlled substances, including prescription stimulants, to other people AND that it is illegal to obtain drugs outside of the user’s own medical prescription. This legal bright-line is an important public health warning that is too often ignored by students and others who deal with this problem. Seldom is this legal reality even mentioned or discussed in relationship to the nonmedical use of prescription stimulants. Educating students about the legal ramifications of sharing and selling prescription drugs and the rationale behind these laws is warranted.

The Role of the Physicians and other Health Professionals

Physicians can have a significant impact on reducing nonmedical use by addressing issues of diversion and nonmedical use with their patients upon prescribing these medications. McLellan and Turner²³ recently articulated the critical need to change prescribing practices for opiate medications. They suggested specific ways physicians could monitor possible overuse of opiates, thereby reducing prescription opiate abuse and life-threatening consequences. Similar to what has been developed for prescription analgesics, specific guidelines should be developed and disseminated to articulate: 1) how to monitor patients for the misuse of prescription stimulants; 2) clear indications for clinical use of ADHD medications; 3) how to screen for

contraindication; and 4) the need for an informed consent form that cautions against sharing and selling of the prescribed medication. Physicians need to be aware that giving away and selling prescribed stimulants is widespread, and that it is a prominent part of the serious problem of prescription drug abuse among college students. In fact, the majority of stimulants being used nonmedically by college students originate from students being treated for ADHD who share and/or sell their stimulants to other students who desire them for nonmedical use.^{6, 18, 24} Although some students obtain a prescription for stimulants by deceiving their prescribing physician, in the majority of cases, the medication is obtained through the course of necessary medical care.

For example, when physicians prescribe stimulants for the treatment of ADHD, they should directly caution all patients against diversion, inform them of the legal and health risks of diversion and, when appropriate, work with parents or caregivers to reinforce this message. Assessment and diagnosis of ADHD can be challenging and must involve a comprehensive determination of comorbid psychiatric disorders (e.g., depression, anxiety and PTSD).²⁵ Careful consideration must be given to the extent to which possible trauma and other psychiatric problems might be contributing to an individual's clinical symptoms.²⁶ Physicians need to emphasize to their patients, especially college student patients, that giving away or selling their medicine is both illegal and can cause harm to the nonmedical user because of the potential for addiction and adverse side effects. Research by our group and others is underway to help physicians recognize which patients are at particularly high risk for diverting their medication. Preliminary research shows that conduct problems and illicit drug use are key risk factors for diversion.²⁷ Prescribing physicians should carefully screen their patients for these risk factors when prescribing stimulants, and, if stimulants are prescribed, they should monitor patients with a history of such problems closely. Other health professionals, such as school nurses, should be similarly aware of issues related to diversion and caution students about the risks of sharing and/or selling their prescription drugs and using substances nonmedically.

Ideally, monitoring for medication adherence and diversion should become part of standard care. Moreover, urine toxicology screens should be routinely used to detect recent drug use, especially for patients with a history of substance abuse, those who admit to nonmedical use of prescription stimulants, or are at high risk for substance abuse for some other reason (e.g., the presence of a comorbid psychiatric disorder).

When college students test positive for drug use or admit nonmedical use, physicians and other health care professionals can implement standard screening and brief interventions. When necessary, more thorough evaluations can be suggested and referrals to age-appropriate substance abuse treatment and 12-step programs (i.e., Alcoholics Anonymous and Narcotics Anonymous) can be made. Since substance use disorders (SUD) are typically chronic and resistant to treatment, it is imperative that physicians monitor college students with SUDs via repeated drug tests and patient interviews, to help substance-abusing students become and stay drug-free.

It will be important to incorporate issues related to diversion and nonmedical use of prescription drugs into recent efforts to improve comprehensive medical education on the nature of addiction. Increasing the amount of attention to these issues would be especially important for the training of physicians who care for adolescents and young adults since multiple forms of risky substance use is often the norm rather than the exception in this age group. There might be opportunities to integrate new research findings related to nonmedical use of all psychoactive prescription drugs into continuing medical education programs for pediatrics, adolescent medicine, and psychiatry.

The Role of the Pharmaceutical Industry

Advances in pharmaceutical science have led to the development of “abuse-resistant” formulations of prescription stimulants. This approach might help reduce nonmedical use without compromising the medical management of ADHD. Importantly, abuse-resistance can take many forms including extended-release mechanisms that reduce the number of pills available for diversion. Substance abusers routinely seek rapidly rising and high blood levels of abused substances to produce brain reward. In contrast to this pattern, virtually all medical treatments require relatively stable, and typically far lower, blood levels of the drug than abusers seek.²⁸ Other abuse-resistant formulations have relatively slower onset of action and maintain steady blood concentrations. These abuse-resistant formulations are based on research findings that have demonstrated associations between the abuse potential of stimulants and the initial spike in plasma concentrations.^{29–31} Although more research is needed to validate claims of abuse resistance over time in the real world college drug scene, the available evidence suggests that abuse-resistant formulations of prescription stimulants are significantly less likely to be abused than are other formulations.³² Given the high level of nonmedical use and diversion, especially by college students, abuse resistance is an important consideration in the prescribing of prescription stimulants—especially in this high risk population.

Equally important is the need to ensure over time that the abuse-resistant features resist efforts of drug abusers to overcome them. Earlier unfortunate experiences have shown the resourcefulness of drug abusers in overcoming abuse resistance mechanisms, such as by crushing the medication prior to ingestion.³³ For this reason it is essential that pharmaceutical manufacturers monitor the nonmedical use of their products to ensure that the abuse-resistant features of their products are effective, not just when the product is introduced but over the entire life of the product, since the ability to overcome abuse resistant features can be achieved later in the product’s lifecycle.

Finally, it is important that the federal government’s regulatory agencies dealing with controlled substances, the Food and Drug Administration (FDA) and the Drug Enforcement Administration (DEA) recognize abuse resistance as an important feature of controlled substances. Manufacturers who demonstrate that their products are abuse-resistant should be given advantages in the market place, including labeling describing the products’ abuse resistance, and scheduling to lower levels of the Controlled Substances Act. A number of recommendations to strengthen FDA regulations of controlled prescription drugs were discussed in an earlier report by the National Center on Addiction and Substance Abuse.³⁴ Increasing the number and availability of abuse-resistant formulations of controlled prescription substances can have a marked impact on reducing nonmedical use without compromising patient care.

Parental Tolerance toward Nonmedical Use

Parents have a key role to play in the prevention of high-risk and dangerous behaviors in their college-attending children diagnosed with ADHD. Increasing parents’ understanding of the problem of nonmedical use of prescription stimulants and other controlled substances will enable them to discuss the issue intelligently with their children. Today, many parents are unaware that their college-attending children are nonmedically using prescription stimulants, or, even worse, many parents appear to be enabling the problem by turning a blind eye or even encouraging the behavior. Fueled by their concerns about maximizing their child’s academic performance, these parents are highly susceptible to the myths described above, namely that, at best, nonmedical use of prescription stimulants might help their child earn better grades, and that, at worst, it is harmless. Parents rightfully should be concerned about their child’s academic success, especially in light of the financial sacrifices made to send a child to college. However, parents should promote responsible study habits and discourage illegal behaviors such as

nonmedical use of prescription stimulants. Parents must be encouraged to discuss these popular myths with their children, and emphasize that attending class, completing assignments on time, and keeping up with schoolwork on a regular basis is the most likely—albeit difficult and even boring—strategy to achieve superior academic performance. A useful and appropriate analogy can be drawn with weight management strategies. “Crash” dieting, pills, and purging are ineffective long-term strategies for maintaining a healthy weight. The healthy way to long-term success involves regular exercise and healthy eating habits.

Parents can also advocate for accessing university-based and other professional resources when academic problems surface. Moreover, if they find out or suspect their child is using prescription stimulants nonmedically, they should take it seriously and regard it as a marker for other possible problems with substance abuse or mental health, which should be addressed by a health care professional. They should emphasize to their children the risks of alcohol and other drug use, and underline the importance of not violating the law. Confronting the problem of nonmedical use of prescription stimulants can present a teaching and learning opportunity for students and for their parents. Parents should help their children stay focused on the goal of academic performance, and help them recognize the healthy, legal and sustainable strategies that will lead to that goal. Drug abuse is a major threat to students achieving this goal. Reducing nonmedical drug use is not about “catching” bad actors on campus. Instead it is about helping youth achieve their potential in college.

Parents of children with ADHD should reinforce the fact that nonmedical use and giving away or selling prescribed controlled substances—including prescription stimulants—is not only illegal, but also harmful to other students. Furthermore, the problem of nonmedical drug use poses a real threat to the student’s future access to the medication for therapeutic use, as a result of escalating public concern about these products. Good citizenship requires using prescribed medicines only as recommended by physicians and only by the person for whom they were prescribed.

The Role of Postsecondary Institutions

Among all of the issues facing higher education today, including deepening financial concerns, safety issues, housing, and faculty concerns—the issue of nonmedical use of prescription drugs to a college administrator may seem trivial. Yet, nonmedical use should be viewed in the context of the larger issue of substance abuse and mental health problems on college campuses. Drug use opportunities increase dramatically during the college years and have long been ignored by college administrators. National studies have called attention to the prevalence of psychiatric disorders, including substance abuse disorders among college students. Dialogue should ensue to understand the bidirectional connections between student health risk behaviors and the health of the institution itself, and, most importantly, how these behaviors and the lack of available early intervention services might be associated with poor academic experiences.

Specifically, colleges should promote awareness of the risks of sharing and selling prescriptions. Campus administrators, health center personnel, and resident advisors should be educated about the problem, and all should be involved in dispelling myths about nonmedically using stimulants to increase academic performance.

Colleges and universities can address this widespread problem during freshman orientation by outlining the university’s policies on diversion and nonmedical use of prescribed controlled substances, including prescription stimulants. In addition, this information should be clearly described in the student handbook to further emphasize the fact that this illegal behavior will not be tolerated any more than illicit drug use will be.

Campus health centers should address issues of nonmedical use of prescribed medications with the students they treat. Health center personnel can discuss the harms associated with nonmedical use with patients who receive prescriptions from the health center. Another strategy is to develop creative dissemination strategies to provide information on the problems associated with nonmedical use, including circulating information with every prescription the student receives from the health center, or using peer education with natural social networks (i.e., fraternities and sororities).

One unfortunate corollary of normalizing nonmedical drug use, including the nonmedical use of prescription stimulants, is to make the larger proportion of students who do not engage in these unhealthy and illegal activities perceive this behavior as being commonplace and feel pressure to follow suit, either by diverting their prescribed stimulants or by using someone else's stimulants nonmedically. Prevention and education require a reversal of this distorted picture of student behavior. It is the nonmedical use of drugs, including prescribed stimulants, that needs to be actively discouraged and the medical use of appropriate medicines that needs to be normalized. To that end, prevention, education, and media outlets should highlight the reality that most college students do not use prescription stimulants nonmedically, including the large majority of the most successful students and the students for whom these medicines are prescribed. All too often it is the nonmedical use of prescription stimulants that gets the focus, creating the erroneous view that this is normative behavior.

STRATEGIES TO PREVENT NONMEDICAL USE OF PRESCRIPTION STIMULANTS

We offer eight recommendations to reduce this contemporary public health problem. Some of these recommendations are appropriate to the entire range of substance abuse by college students, including the use of alcohol, marijuana, and other illicit drugs, while other recommendations are specific to the nonmedical use of prescription stimulants.

The following recommendations, based on the most current scientific evidence, represent the consensus of opinion among a multidisciplinary group of professionals, including substance use epidemiologists, and clinicians who work specifically with substance abuse and ADHD treatment on college campuses:

- Strategy #1: Dispel the popular myths regarding nonmedical prescription stimulant use by disseminating research findings.
- Strategy #2: Promote awareness of the legal risks for diversion and nonmedical use of prescription stimulants.
- Strategy #3: Encourage physicians to increase their vigilance regarding prescription stimulants to ensure proper and safe use and to prevent diversion.
- Strategy #4: Continue research regarding the relative benefits of abuse-resistant formulations of prescription stimulants.
- Strategy #5: Empower parents to take a central role in the prevention of nonmedical use of prescription stimulants.
- Strategy #6: Develop multidisciplinary campus action plans to reduce nonmedical prescription stimulant use.
- Strategy #7: De-stigmatize college students who do not divert their medications or engage in illicit drug use, and encourage peers to discuss the potential negative consequences of nonmedical use.

- Strategy #8: Develop early intervention strategies to assess risk, and prevent progression to serious substance abuse and dependence problems.

CONCLUSIONS

Abundant evidence supports effective measures to reduce the large and growing problem of the nonmedical use of prescription stimulants among college students. By informing the public—in particular students, parents, and health professionals—about the facts of this behavior, the nonmedical use of prescription stimulants can be both deglamorized and reduced. The eight recommendations presented here are steps toward advancing discussions among key players: students, parents, physicians, college personnel including administrators and teachers, government, and the pharmaceutical industry.

This paper dispels some of the common myths that not only normalize but rationalize and even encourage the nonmedical use of prescription stimulants. These myths are now perpetuated in the popular media and have seeped into the college culture. We believe these myths have clouded the thinking about the potential harms associated with the nonmedical use of prescription stimulants. Most importantly, much scientific evidence is now available to show that the nonmedical use of prescription stimulants should not be viewed in isolation as a one-time attempt at gaining a competitive edge, but rather as part of a larger constellation of illicit and potentially problematic behaviors relating to drug and alcohol involvement.

By identifying eight key strategies described above—aimed at empowering students, parents, physicians, university officials, law enforcement, and government officials—to address the nonmedical use of prescription stimulants, we have outlined a comprehensive plan to reduce nonmedical prescription stimulant use among college students. Dispelling myths, disseminating correct information, and encouraging new research and technology to learn more about the nature of the issue, to identify risk factors and to develop abuse-resistant drug formulations will go a long way toward reducing the nonmedical use of prescription stimulants and other controlled substances.

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TABLE 1

Summary of studies on the association between nonmedical prescription stimulant use and other illicit drug use

Author	Sample	Findings regarding the association between nonmedical use of prescription stimulants and illicit drug use
Arria, et al. (2008) ⁵	1,253 college students	Nonmedical use of prescription stimulants is associated with past year illicit drug use, alcohol dependence, and marijuana dependence.
Barrett, Darredeau & Pihl (2006) ³⁵	149 college students	72% of nonmedical prescription methylphenidate users ingested another drug simultaneously with methylphenidate.
Barrett, et al. (2005) ²⁰	100 college students	Nonmedical users of prescription stimulants were more likely to have used marijuana (96% vs. 76% of those who did not use nonmedically), cocaine (60% vs. 22%), psilocybin (82% vs. 48%) and ecstasy (78% vs. 24%) in their lifetime.
DeSantis, Noar & Webb (2009) ³⁶	333 college fraternity members	Nonmedical use of prescription stimulants was associated with more frequent marijuana use.
Hall, et al. (2005) ³⁷	381 college students	15.4% of nonmedical prescription stimulant users used stimulants with alcohol, and 21.2% used with other drugs.
Herman-Stahl, et al. (2006) ³⁸	17,709 adolescents	Use of marijuana and other illicit drugs was associated with nonmedical use of prescription stimulants.
Herman-Stahl, et al. (2007) ³⁹	23,645 young adults	Binge drinking, using marijuana and using other illicit drugs was associated with nonmedical prescription stimulant use.
Low & Gendaszek (2002) ⁴⁰	150 college students	Nonmedical use of prescription stimulants was associated with cocaine and ecstasy use.
McCabe, Boyd & Young (2007) ⁴¹	1,086 7 th –12 th graders	58.3% of medical and nonmedical users of prescription stimulants abused an illicit drug besides marijuana, as opposed to 4.0% of non-stimulant users.
McCabe, Cranford & Boyd (2006) ⁴²	43,093 adults	Binge drinking and DSM-IV criteria for alcohol abuse and dependence were significantly associated with nonmedical prescription stimulant use.
McCabe, et al. (2005) ⁴	10,904 college students	Nonmedical users of prescription stimulants were more likely to have engaged in frequent binge drinking (69% vs. 21% of those who did not use prescription stimulants), marijuana use (85% vs. 27%), cocaine use (35% vs. 2%), ecstasy use (52% vs. 5%), opiate (other than heroin) use (44% vs. 6%) in the past year.
McCabe, Teter & Boyd (2006) ⁶	9,161 college students	Nonmedical users of prescription stimulants were more likely to report past year binge drinking (88% vs. 49% who did not use stimulants nonmedically), marijuana use (93% vs. 34%), cocaine use (33% vs. 2%), ecstasy use (27% vs. 2%), and hallucinogen use (34% vs. 3%).
Novak, et al. (2007) ⁴³	4,297 adults	Nonmedical use of prescription stimulants was associated with past month binge drinking, past year marijuana use and past year cocaine use.
Schepis & Krishnan-Sarin (2008) ⁴⁴	18,678 adolescents aged 12–17	Nonmedical use of prescription stimulants was associated with past year use of alcohol, tobacco, marijuana, cocaine and inhalants.
Teter, et al. (2003) ¹⁹	2,250 college students	Nonmedical methylphenidate users were more likely to engage in binge drinking in the past two weeks (98.2% vs. 58.3% of nonstimulant users), marijuana use in the past year (100.0% vs. 29.9%) and ecstasy use in the past year (57.9% vs. 5.3%).